

# WHAT IS CLAIMED IS:

1. A purified DNA molecule encoding a human uncoupling protein 3 which comprises the nucleotide sequence

SUB  
PI 5

	TCGAACTCAC	TCACCTCCCC	TCTCACCTCA	CTGCCCTCAC	CAGCCAGCCT
	CTTGTC AAGT	GATCAGGCTG	TCAACCAACT	TCTCTAGGAT	AAGGTTTCAG
	GTCAGCCTGT	GTGTATAAGA	CCAGTGCCAA	GCCAGAAGCA	GCAGAGACAA
	CAGTGAATGA	CAAGGAGGGG	CCATCCAATC	CCTGCTGCCA	CCTCCTGGGA
	TGGAGCCCTA	GGGAGCCCCCT	GTGCTGCCCC	TGCCGTGGCA	GGACTCACAG
10	CCCCACCGCT	GCACTGAAGC	CCAGGGCTGT	GGAGCAGCTC	TCTCCTTGGA
	CTCCTCTCGG	CCCTAAAGGG	ACTGGGCAGA	GCCTTCCAGG	ACTATGGTTG
	GACTGAAGCC	TTCAGACGTG	CCTCCCACCA	TGGCTGTGAA	GTTCCTGGGG
	GCAGGCACAG	CAGCCTGTTT	TGCTGACCTC	GTTACCTTTC	CACTGGACAC
	AGCCAAGGTC	CGCCTGCAGA	TCCAGGGGGA	GAACCAGGCG	GTCCAGACGG
15	CCCGGCTCGT	GCAGTACCGT	GGCGTGCTGG	GCACCATCCT	GACCATGGTG
	CGGACTGAGG	GTCCCTGCAG	CCCCTACAAT	GGGCTGGTGG	CCGGCCTGCA
	GCGCCAGATG	AGCTTCGCCT	CCATCCGCAT	CGGCCTTTAC	GACTCCGTCA
	AGCAGGTGTA	CACCCCCAAA	GGCGCGGACA	ACTCCAGCCT	CACTACCCGG
	ATTTTGGCCG	GCTGCACCAC	AGGAGCCATG	GCGGTGACCT	GTGCCCAGCC
20	CACAGATGTG	GTGAAGGTCC	GATTTCAAGC	CAGCATAAC	CTCGGGCCAT
	CCAGGAGCGA	CAGAAAATAC	AGCGGGACTA	TGGACGCCTA	CAGAACCATC
	GCCAGGGAGG	AAGGAGTCAG	GGGCCTGTGG	AAAGGAACTT	TGCCCAACAT
	CATGAGGAAT	GCTATCGTCA	ACTGTGCTGA	GGTGGTGACC	TACGACATCC
	TCAAGGAGAA	GCTGCTGGAC	TATCACCTGC	TCACTGACAA	CTTCCCCTGC
25	CACTTTGTCT	CTGCCTTTGG	AGCCGGCTTC	TGTGCCACAG	TGGTGGCCTC
	CCCGGTGGAC	GTGGTGAAGA	CCCGGTATAT	GAACTCACCT	CCAGGCCAGT
	ACTTCAGCCC	CCTCGACTGT	ATGATAAAGA	TGGTGGCCCA	GGAGGGCCCC
	ACAGCCTTCT	ACAAGGGATT	TACACCCTCC	TTTTTGCGTT	TGGGATCCTG
	GAACGTGGTG	ATGTTTCGTAA	CCTATGAGCA	GCTGAAACGG	GCCCTGATGA
30	AAGTCCAGAT	GTTACGGGAA	TCACCGTTTT	GAACAAGACA	AGAAGGCCAC
	TGGTAGCTAA	CGTGTCCGAA	ACCAGTTAAG	AATGGAAGAA	AACGGTGCAT
	CCACGCACAC	ATGGACACAG	ACCCACACAT	GTTTACAGAA	CTGTTGTTTA
	CTTGTTGCTG	ATTCAAGAAA	CAGAAGTAGA	AGAGAGAGGA	TTCTGGTCTT
	CACTGCCATG	CCTCAAGAAC	ACCTTTGTTT	TGCACTGACA	AGATGGAAAA
35	TAAATTATAT	TAATTTTGA	AACCCATTAG	GCATGCCTAA	TATTTAGGCA

AGAGAAAATA AACCAAGATA GATCCATTTG GACAAAATGG AAGGTTGGAG  
 ACGTGTATCC CCGTGAAATC TGGTCAGATA ATGAATGATA AGCAGGAAGG  
 ATGGCAAGCA CGGGACAGGA GGGGCCCACA ATGGAGTGGG AGATCAGCCA  
 CGGAGCCTGG AGGGACGCCA CCCAGCAACA CAGAGCTGGC GACTGCAGCT  
 5 GCACCATCAC ACATGCATCA TCAGCCTATT TGTAATATGT CTGCCACAGA  
 GAGTCCTTTG GGATTCTAGG AAACCCAAGG AACAAAGAGAA AAAACTAGAG  
 CCTGTGCTAA AGAAGCCTGC TGGGCCCATG TGAGGCTGGG GTCGTAAATA  
 TTCCCCGACG ACACTGAAGA ATCAAGAGGG CAGCCCCCAC TTCTCCTACA  
 AAATGGAGGG AGCCATCCCT TCCCTGTCCA CCTCACCAGG GGTGCTATGA  
 10 CATGCAAGTG AGAAGCTGGG CATGAACGCA CTTTATAAAA GCAAAAGCTC  
 TGTGTAAATC TAACTACAAG GACAATGCCT TGGGAGAGAT TTTGTCGGGA  
 CAGAGAGGAG TTGCCAGGGA AGAAGGTTTG AAAGATACGG TTGTCTAGAG  
 GTGAGACCAA AGGATCCAGA GACTTGGGGA CCAGAGGTGA CAGTGGATGA  
 CGTGAAGCCA CAGGAGCCCC ACCCCCATGC AGCTTTTTTCC CCACCCCCC  
 15 CACCACGCGC TCAATCATGA GTACCTCAAA GGATTGTTGG GCTTGGGGGA  
 AAAGAGGTGG ATTCCTGGGC AAGAACCTAA AGTAGCAGGA,  
 disclosed as SEQ ID NO:11.

2. A DNA molecule of claim 1 which comprises from  
 20 about nucleotide 344 to about nucleotide 1282 of SEQ ID NO:11.

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 25 3. A purified DNA molecule encoding human  
 uncoupling protein 3 wherein said DNA molecule encodes a protein  
 comprising the amino acid sequence  
 MVGLKPSDVPPTMAVKFLGAGTAACFADLVTFPLDTAKVRLQIQGENQAVQTARLVQYR  
 GVLGTLTMRTEGPCSPYNGLVAGLQRQMSFASIRIGLYDSVKQVYTPKGADNSSLTT  
 RILAGCTTGAMAVTCAQPTDVVKVRFQASIHGSPSRSDRKYSGMTDAYRTIAREEGVRG  
 LWKGTLNIMRNAIVNCAEVVITYDILKEKLLDYHLLTDNFPCHFVSAFGAGFCATVVAS  
 PVDVVKTRYMNSPPGQYFSPLDCMIKMVAQEGPTAFYKGFPSFLRLGSWNVVMFVITYE  
 30 QLKRALMKVQMLRESPF, as set forth in three-letter abbreviation in SEQ ID  
 NO:12.

4. An expression vector for the expression of a human  
 uncoupling 3 protein in a recombinant host cell wherein said expression  
 35 vector comprises the DNA molecule of claim 1.

5. An expression vector of claim 4 which is a eukaryotic expression vector.

5 6. An expression vector of claim 4 which is a prokaryotic expression vector.

7. A host cell which expresses a recombinant human uncoupling 3 protein wherein said host cell contains the expression vector of claim 4.

8. A host cell which expresses a recombinant human uncoupling 3 protein wherein said host cell contains the expression vector of claim 5.

9. A host cell which expresses a recombinant human uncoupling protein 3 wherein said host cell contains the expression vector of claim 6.

10. A host cell of claim 7 wherein said human uncoupling protein 3 is overexpressed from said expression vector.

11. A host cell of claim 8 wherein said human uncoupling protein 3 is overexpressed from said expression vector.

12. A host cell of claim 9 wherein said human uncoupling protein 3 is overexpressed from said expression vector.

13. A subcellular membrane fraction obtained from the host cell of claim 10 which contains recombinant human uncoupling protein 3.

14. A subcellular membrane fraction obtained from the host cell of claim 11 which contains recombinant human uncoupling protein 3.

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(a) transfecting the expression vector of claim 4 into a suitable host cell; and,

(b) culturing the host cells of step (a) under conditions which allow expression of the human uncoupling protein from the expression vector.

13. An expression vector for the expression of a human uncoupling protein 3 in a recombinant host cell wherein said expression vector comprises the DNA molecule of claim 12.

20. A purified DNA molecule encoding a mouse uncoupling protein which comprises the nucleotide sequence

CCAGGAACAG CAGAGACAAC AGTGAATGGT GAGGCCCCGGC CGTCAGATCC  
 15 TGCTGCTACC TAATGGAGTG GATCCTTAGG GTGGCCCTGC ACTACCCAAC  
 CTTGGCTAGA CGCACAGCTT CCTCCCTGAA CTGAAGCAAA AGATTGCCAG  
 GCAAGCTCTC TCCTCGGACC TCCATAGGCA GCAAAGGAAC CAGGCCCATC  
 CCCCAGGACC ATGGTTGGAC TTCAGCCCTC CGAAGTGCCT CCCACAACGG  
 TTGTGAAGTT CCTGGGGGCC GGCAGTGCCT CCTGTTTTGC GGACCTCCTC  
 20 ACTTTTCCCC TGGACACCGC CAAGGTCCGT CTGCAGATCC AAGGGGAGAA  
 CCCAGGGGCT CAGAGCGTGC AGTACCGCGG TGTGCTGGGT ACCATCCTGA  
 CTATGGTGCG CACAGAGGGT CCCCAGAGCC CCTACAGCGG ACTGGTCGCT  
 GGCCTGCACC GCCAGATGAG TTTTGCCTCC ATTCGAATTG GCCTCTACGA  
 CTCTGTCAAG CAGTTCTACA CCCCCAAGGG AGCGGACCAC TCCAGCGTCG  
 25 CCATCAGGAT TCTGGCAGGC TGCACGACAG GAGCCATGGC AGTGACCTGC  
 GCCCAGCCCA CGGATGTGGT GAAGGTCCGA TTTCAAGCCA TGATACGCCT  
 GGGAAGTGA GGAGAGAGGA AATACAGAGG GACTATGGAT GCCTACAGAA  
 CCATCGCCAG GGAGGAAGGA GTCAGGGGCC TGTGGAAAGG GACTTGGCCC  
 AACATCACAA GAAATGCCAT TGTCAACTGT GCTGAGATGG TGACCTACGA  
 30 CATCATCAAG GAGAAGTTGC TGGAGTCTCA CCTGTTTACT GACAACTTCC  
 CCTGTCACTT TGTCTCTGCC TTTGGAGCTG GCTTCTGTGC CACAGTGGTG  
 GCCTCCCCGG TGGATGTGGT AAAGACCCGA TACATGAACG CTCCCCTAGG  
 CAGGTACCGC AGCCCTCTGC ACTGTATGCT GAAGATGGTG GCTCAGGAGG  
 GACCCACGGC CTCTACAAA GGATTTGTGC CCTCCTTTCT GCGTCTGGGA  
 35 GCTTGGAACG TGATGATGTT TGTAACATAT GAGCAACTGA AGAGGGCCTT

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15. A subcellular membrane fraction obtained from the host cell of claim 12 which contains recombinant human uncoupling protein 3.

5 16. A purified DNA molecule which consists of the nucleotide sequence

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10	TCGAACTCAC	TCACCTCCCC	TCTCACCTCA	CTGCCCTCAC	CAGCCAGCCT
	CTTGTCAAGT	GATCAGGCTG	TCAACCAACT	TCTCTAGGAT	AAGGTTTCAG
	GTCAGCCTGT	GTGTATAAGA	CCAGTGCCAA	GCCAGAAGCA	GCAGAGACAA
	CAGTGAATGA	CAAGGAGGGG	CCATCCAATC	CCTGCTGCCA	CCTCCTGGGA
	TGGAGCCCTA	GGGAGCCCCCT	GTGCTGCCCC	TGCCGTGGCA	GGACTCACAG
	CCCCACCGCT	GCACTGAAGC	CCAGGGCTGT	GGAGCAGCTC	TCTCCTTGGA
	CTCCTCTCGG	CCCTAAAGGG	ACTGGGCAGA	GCCTTCCAGG	ACTATGGTTG
	GACTGAAGCC	TTCAGACGTG	CCTCCCACCA	TGGCTGTGAA	GTTCTTGGGG
15	GCAGGCACAG	CAGCCTGTTT	TGCTGACCTC	GTTACCTTTC	CACTGGACAC
	AGCCAAGGTC	CGCCTGCAGA	TCCAGGGGGA	GAACCAGGCG	GTCCAGACGG
	CCCGGCTCGT	GCAGTACCGT	GGCGTGCTGG	GCACCATCCT	GACCATGGTG
	CGGACTGAGG	GTCCCTGCAG	CCCTACAAT	GGGCTGGTGG	CCGGCCTGCA
	GCGCCAGATG	AGCTTCGCCT	CCATCCGCAT	CGGCCTTTAC	GACTCCGTCA
20	AGCAGGTGTA	CACCCCCAAA	GGCGCGGACA	ACTCCAGCCT	CACTACCCGG
	ATTTTGGCCG	GCTGCACCAC	AGGAGCCATG	GCGGTGACCT	GTGCCCAGCC
	CACAGATGTG	GTGAAGGTCC	GATTTTCAGG	CAGCATAAC	CTCGGGCCAT
	CCAGGAGCGA	CAGAAAATAC	AGCGGGACTA	TGGACGCCTA	CAGAACCATC
	GCCAGGGAGG	AAGGAGTCAG	GGGCCTGTGG	AAAGGAACTT	TGCCCAACAT
25	CATGAGGAAT	GCTATCGTCA	ACTGTGCTGA	GGTGGTGACC	TACGACATCC
	TCAAGGAGAA	GCTGCTGGAC	TATCACCTGC	TCACTGACAA	CTTCCCCTGC
	CACTTTGTCT	CTGCCTTTGG	AGCCGGCTTC	TGTGCCACAG	TGGTGGCCTC
	CCCGGTGGAC	GTGGTGAAGA	CCCGGTATAT	GAACACACCT	CCAGGCCAGT
	ACTTCAGCCC	CCTCGACTGT	ATGATAAAGA	TGGTGGCCCA	GGAGGGCCCC
30	ACAGCCTTCT	ACAAGGGATT	TACACCCTCC	TTTTTGCGTT	TGGGATCCTG
	GAACGTGGTG	ATGTTTCGTAA	CCTATGAGCA	GCTGAAACGG	GCCCTGATGA
	AAGTCCAGAT	GTTACGGGAA	TCACCGTTTT	GAACAAGACA	AGAAGGCCAC
	TGGTAGCTAA	CGTGTCCGAA	ACCAGTTAAG	AATCGAAGAA	AACGGTGCAT
	CCACGCACAC	ATGGACACAG	ACCCACACAT	GTTTACAGAA	CTGTTGTTTA
35	CTTGTTGCTG	ATTCAAGAAA	CAGAAGTAGA	AGAGAGAGGA	TTCTGGTCTT

CACTGCCATG CCTCAAGAAC ACCTTTGTTT TGCCTGACA AGATGGAAAA  
 TAAATTATAT TAATTTTGA AACCCATTAG GCATGCCTAA TATTTAGGCA  
 AGAGAAAATA AACCAAGATA GATCCATTG GACAAAATGG AAGGTTGGAG  
 ACGTGTATCC CCGTGAAATC TGGTCAGATA ATGAATGATA AGCAGGAAGG  
 5 ATGGCAAGCA CGGGACAGGA GGGGCCACA ATGGAGTGGG AGATCAGCCA  
 CGGAGCCTGG AGGGACGCCA CCCAGCAACA CAGAGCTGGC GACTGCAGCT  
 GCACCATCAC ACATGCATCA TCAGCCTATT TGTAATATGT CTGCCACAGA  
 GAGTCCTTTG GGATTCTAGG AAACCCAAGG AACAAGAGAA AAAACTAGAG  
 CCTGTGCTAA AGAAGCCTGC TGGGCCCATG TGAGGCTGGG GTCGTAAATA  
 10 TTCCCCGACG AACTGAAGA ATCAAGAGGG CAGCCCCAC TTCTCCTACA  
 AAATGGAGGG AGCCATCCCT TCCCTGTCCA CCTCACCAGG GGTGCTATGA  
 CATGCAAGTG AGAAGCTGGG CATGAACGCA CTTTATAAAA GCAAAAGCTC  
 TGTGTAAATC TAACTACAAG GACAATGCCT TGGGAGAGAT TTTGTCGGGA  
 CAGAGAGGAG TTGCCAGGGA AGAAGGTTTG AAAGATACGG TTGTCTAGAG  
 15 GTGAGACCAA AGGATCCAGA GACTTGGGGA CCAGAGGTGA CAGTGGATGA  
 CGTGAAGCCA CAGGAGCCCC ACCCCCATGC AGCTTTTTTCC CCACCCCCC  
 CACCACGCGC TCAATCATGA GTACCTCAA GGATTGTTGG GCTTGGGGGA  
 AAAGAGGTGG ATTCCTGGGC AAGAACCTAA AGTAGCAGGA,  
 disclosed as SEQ ID NO:11.

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17. A purified DNA molecule encoding a human uncoupling protein 3 wherein said DNA molecule encodes a protein consisting of the amino acid sequence

MVGLKPSDVPPTMAVKFLGAGTAACFADLVTFPLDTAKVRLQIQGENQAVQTARLVQYR  
 25 GVLGTLTMRTEGPCSPYNGLVAGLQRQMSFASIRIGLYDSVKQVYTPKGADNSSLT  
 RILAGCTTGAMAVTCAQPTDVVKVRFQASIHLPSSDRKYSGMTDAYRTIAREEGVRG  
 LWKGTLNIMRNAIVNCAEVVTDILKEKLLDYHLLTDNFPCHFVSAFGAGFCATVVAS  
 PVDVVKTRYMNSPPGQYFSPLDCKIMVAQEGPTAFYKGFPSFLRLGSWNVVMFVTYPE  
 QLKRALMKVQMLRESPF,

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as set forth in three-letter abbreviation in SEQ ID NO:12.

18. A process for the expression of a human uncoupling protein 3 in a recombinant host cell, comprising:

AATGAAAGTC CAGGTACTGC GGAATCTCC GTTTTGAACA AGGCAAGCAG  
 GCTGCCTGGA ACAGAACAAA GCGTCTCTGC CCTGGGGACA CAGGCCCACA  
 CGGTCCAGAA CCCTGCACTG CTGCTGACAC GAGAAACTGA ACTAAAAGAG  
 GAGAGTTTTA GTCCTCCGTG TTTCGTCCTA AAACACCTCT GTTTTGCAC  
 5 GACCTGATGG GAAATAAATT ATATTAATTT TTAAACCCTT TCCGGTTGGA  
 TGCCTAACAT TTAGGCAAGA GACAACAAAG AAAACCAGAG TCAACTCCCT  
 TGAAATGTAG GAATAAAGGA TGCATAATAA ACAGGAAAGG CACAGGTTTT  
 GAGAAGATCA GCCCACAGTG TTGTCCTTGA ATCAAACAAA ATGGTCGGAG  
 GAACCCTTCG GGTTTCAGCAC AAAGAGGTGA CTACAGCCTT TTGGTCACCA  
 10 GATGACTCCG CCCCTTTGTA ATGAGTCTGC CAAGTAGACT CTATCAAGAT  
 TCTGGGGAAA GGAGAAAGAA CACATTGACC TGCCCGGGCG GCCGCTCGAG  
 CCCTATGA, disclosed as SEQ ID NO:17.

21. A DNA molecule of claim 20 which comprises from  
 15 about nucleotide 211 to about nucleotide 1137 of SEQ ID NO:17.

22. A purified DNA molecule encoding mouse  
 uncoupling protein 3 wherein said DNA molecule encodes a protein  
 comprising the amino acid sequence, MVGLQPSEVP PTTVVKFLGA  
 20 GTAACFADLL TFPLDTAKVR LQIQGENPQA QSVQYRGVLG TILTMVRTEG  
 PRSPYSGLVA GLHRQMSFAS IRIGLYDSVK QFYTPKGADH SSVAIRILAG  
 CTTGAMAVTC AQPTDVVKVR FQAMIRLGTG GERKYRGTM D AYRTIAREEG  
 VRGLWKGTWP NITRNAIVNC AEMVTYDIIK EKLLESHLFT DNFPCHFVSA  
 FGAGFCATVV ASPVDVVKTR YMNAPLGRYR SPLHCMLKMV AQEGPTAFYK  
 25 GFVPSFLRLG AWNVMMFVTY EQLKRALMKV QVLRESPF\*, as set forth in  
 three-letter abbreviation in SEQ ID NO:18.

23. An expression vector for the expression of a mouse  
 uncoupling protein 3 in a recombinant host cell wherein said expression  
 30 vector comprises the DNA molecule of claim 20.

24. An expression vector of claim 23 which is a  
 eukaryotic expression vector.

25. An expression vector of claim 23 which is a prokaryotic expression vector.

5 26. A host cell which expresses a recombinant mouse uncoupling protein 3 wherein said host cell contains the expression vector of claim 23.

10 27. A host cell which expresses a recombinant mouse uncoupling 3 protein wherein said host cell contains the expression vector of claim 24.

15 28. A host cell which expresses a recombinant mouse uncoupling protein 3 wherein said host cell contains the expression vector of claim 25.

29. A host cell of claim 26 wherein said mouse uncoupling protein 3 is overexpressed from said expression vector.

20 30. A host cell of claim 27 wherein said mouse uncoupling protein 3 is overexpressed from said expression vector.

31. A host cell of claim 28 wherein said mouse uncoupling protein 3 is overexpressed from said expression vector.

25 32. A subcellular membrane fraction obtained from the host cell of claim 29 which contains recombinant mouse uncoupling protein 3.

30 33. A subcellular membrane fraction obtained from the host cell of claim 30 which contains recombinant mouse uncoupling protein 3.

35 34. A subcellular membrane fraction obtained from the host cell of claim 31 which contains recombinant mouse uncoupling protein 3.



35. A purified DNA molecule which consists of the nucleotide sequence,

CCAGGAACAG CAGAGACAAC AGTGAATGGT GAGGCCCGGC CGTCAGATCC  
 5 TGCTGCTACC TAATGGAGTG GATCCTTAGG GTGGCCCTGC ACTACCCAAC  
 CTTGGCTAGA CGCACAGCTT CCTCCCTGAA CTGAAGCAAA AGATTGCCAG  
 GCAAGCTCTC TCCTCGGACC TCCATAGGCA GCAAAGGAAC CAGGCCCAT  
 CCCCAGGACC ATGGTTGGAC TTCAGCCCTC CGAAGTGCCT CCCACAACGG  
 TTGTGAAGTT CCTGGGGGCC GGCCTGCGG CCTGTTTTGC GGACCTCCTC  
 10 ACTTTTCCCC TGGACACCGC CAAGGTCCGT CTGCAGATCC AAGGGGAGAA  
 CCCAGGGGCT CAGAGCGTGC AGTACCGCGG TGTGCTGGGT ACCATCCTGA  
 CTATGGTGC GACAGAGGGT CCCCAGAGCC CCTACAGCGG ACTGGTGCCT  
 GGCTGCACC GCCAGATGAG TTTTGCTCTC ATTCGAATTG GCCTCTACGA  
 CTCTGTCAAG CAGTTCTACA CCCCCAAGG AGCGGACCAC TCCAGCGTCG  
 15 CCATCAGGAT TCTGGCAGGC TGCACGACAG GAGCCATGGC AGTGACCTGC  
 GCCCAGCCCA CGGATGTGGT GAAGGTCCGA TTTCAAGCCA TGATACGCCT  
 GGGAAGTGA GGAGAGAGGA AATACAGAGG GACTATGGAT GCCTACAGAA  
 CCATCGCCAG GGAGGAAGGA GTCAGGGGCC TGTGGAAAGG GACTTGGCCC  
 AACATCACAA GAAATGCCAT TGTCAACTGT GCTGAGATGG TGACCTACGA  
 20 CATCATCAAG GAGAAGTTGC TGGAGTCTCA CCTGTTTACT GACAACTTCC  
 CCTGTCACCT TGTCTCTGCC TTTGGAGCTG GCTTCTGTGC CACAGTGGTG  
 GCCTCCCCGG TGGATGTGGT AAAGAGCCGA TACATGAACG CTCCCCTAGG  
 CAGGTACCGC AGCCCTCTGC ACTGTATGCT GAAGATGGTG GCTCAGGAGG  
 GACCCACGGC CTTCTACAAA GGATTGTGTC CCTCCTTTCT GCGTCTGGGA  
 25 GCTTGGAAAG TGATGATGTT TGTAACATAT GAGCAACTGA AGAGGGCCTT  
 AATGAAAGTC CAGGTACTGC GGAATCTCC GTTTTGAACA AGGCAAGCAG  
 GCTGCCTGGA ACAGAACAAA GCGTCTCTGC CCTGGGGACA CAGGCCACAA  
 CGGTCCAGAA CCCTGCACTG CTGCTGACAC GAGAAACTGA ACTAAAAGAG  
 GAGAGTTTTA GTCCTCCGTG TTTCGTCTTA AAACACCTCT GTTTTGCCT  
 30 GACCTGATGG GAAATAAATT ATATTAATTT TTAAACCCTT TCCGGTTGGA  
 TGCCTAACAT TTAGGCAAGA GACAACAAAG AAAACCAGAG TCAACTCCCT  
 TGAAATGTAG GAATAAAGGA TGCATAATAA ACAGGAAAGG CACAGGTTTT  
 GAGAAGATCA GCCCACAGTG TTGTCCTTGA ATCAAACAAA ATGGTCGGAG

GAACCCTTCG GGTTCAGCAC AAAGAGGTGA CTACAGCCTT TTGGTCACCA  
 GATGACTCCG CCCCTTTGTA ATGAGTCTGC CAAGTAGACT CTATCAAGAT  
 TCTGGGGAAA GGAGAAAGAA CACATTGACC TGCCCGGGCG GCCGCTCGAG  
 CCCTATGA, disclosed as SEQ ID NO:17.

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36. A purified DNA molecule encoding mouse  
 uncoupling protein 3 wherein said DNA molecule encodes a protein  
 consists of the amino acid sequence MVGLQPSEVP PTTVVKFLGA  
 GTAACFADLL TFPLDTAKVR LQIQGENPGA QSVQYRGVLG TILTMVRTEG  
 10 PRSPYSGLVA GLHRQMSFAS IRIGLYDSVK QFYTPKGADH SSVAIRILAG  
 CTTGAMAVTC AQPTDVVKVR FQAMIRLGTG GERKYRGTM D AYRTIAREEG  
 VRGLWKGTWP NITRNAIVNC AEMVTYDIIK EKLLESHLFT DNFPCHFVSA  
 FGAGFCATV ASPVDVVKTR YMNAPLGRYR SPLHCMLKMV AQEGPTAFYK  
 GFVPSFLRLG AWNVMFVTY EQLKRALMKV QVLRESPF\*, as set forth in  
 15 three-letter abbreviation in SEQ ID NO:18.

37. A process for the expression of a mouse uncoupling  
 protein 3 in a recombinant host cell, comprising:

20 (a) transfecting the expression vector of claim 23 into  
 a suitable host cell; and,

(b) culturing the host cells of step (a) under  
 conditions which allow expression of the human uncoupling protein  
 25 3 from the expression vector.

38. An expression vector for the expression of a mouse  
 uncoupling protein 3 in a recombinant host cell wherein said expression  
 vector comprises the DNA molecule of claim 35.

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39. A method of identifying a modulator of uncoupling protein 3 activity, which comprises:

- 5 (a) combining a modulator of uncoupling protein 3 activity with the uncoupling protein 3 or a biologically active fragment thereof; and,
- (b) measuring the effect of the modulator on the activity of uncoupling protein 3.

10 40. The method of claim 39 wherein said uncoupling protein 3 is human uncoupling protein 3.

41. The method of claim 40 wherein said human uncoupling protein 3 is disclosed as SEQ ID NO:12.

15 42. The method of claim 39 wherein said uncoupling protein 3 is mouse uncoupling protein 3.

20 43. The method of claim 42 wherein said mouse uncoupling protein 3 is disclosed as SEQ ID NO:18.

44. A method of extending at least one partial cDNA sequence for the purpose of characterizing and isolating a full-length cDNA molecule, which comprises:

- 25 a) constructing a cDNA library in a DNA vector primed by random, oligo-dT or a combination of both random and oligo-dT primers;
- b) subdividing the cDNA library into a plurality of
- 30 cDNA pools, each of the cDNA pools containing from about 10,000 to about 20,000 cDNA molecules;
- c) amplifying each cDNA pool;

d) hybridizing oligonucleotide primers complementary to the 5' and 3' portion of the partial cDNA sequence and to the 5' and 3' flanking region of the DNA vector;

5 e) identifying each cDNA molecule which contains a flanking DNA fragment generated by PCR in each positive cDNA pool;

f) sequencing the flanking DNA fragments; and,

10 g) assembling the partial cDNA sequence and the sequence from the flanking DNA fragment(s) into a complete open reading frame.

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